

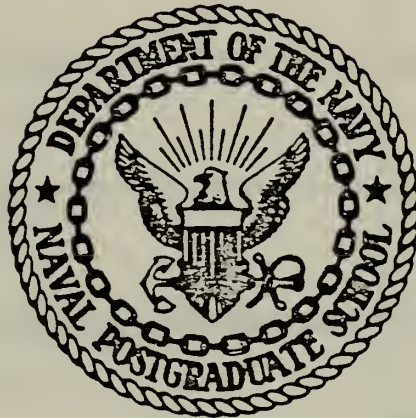
A STUDY ON THE EFFECTIVENESS
OF TRANSACTIONAL ANALYSIS FOR
IMPROVING ORGANIZATIONAL PERFORMANCE

Daniel W. Buckner

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Monterey, California



THESIS

A STUDY ON THE EFFECTIVENESS
OF TRANSACTIONAL ANALYSIS FOR
IMPROVING ORGANIZATIONAL PERFORMANCE

by

Daniel W. Buckner

September, 1976

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IMPROVING ORGANIZATIONAL PERFORMANCE

by

Daniel W. Buckner
Naval Air Test Center, Patuxent River, Md.
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Submitted in partial fulfillment of the
requirements for the degree of

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I. INTRODUCTION

Organizations are concerned with improving performance (Drucker, 1973). Empirical evidence supports the theory that awareness of basic human needs by management can improve performance of the organization (Maslow, 1970).

Further highlighting the importance of an understanding of the basic human needs for improved performance is a statement by Maslow, "When we talk about the needs of human beings we talk about the essence of their lives". Managers, then, must be concerned with basic human needs in order to improve performance.

Much work has been done on the study of basic human needs and the relationships of people working together, but no one system of describing and analyzing human behavior has proven completely successful. Management cannot wait until scientists and scholars have completed their work in this area. Management must try to make the organization perform today (Drucker, 1973).

A new system for understanding basic human behavior has been developed in recent years. This new system for explaining human behavior is called "Transactional Analysis" and was developed by the late Dr. Eric Berne.

OBJECTIVE AND SCOPE OF THIS STUDY

Supervisory and personnel training utilizing both conventional human needs concepts and Transactional analysis techniques have been given to employees in the Department of Defense. The purpose of this study is to compare the relative effectiveness of conventional training and Transactional Analysis for improving performance.

This study is based on the assumption that a greater awareness of basic human needs will lead to improved performance (Maslow, 1970). The study was conducted by use of a survey to determine whether Transactional Analysis, as used at the Pacific Missile Test Center, Point Mugu, California, contributed to a greater awareness of basic human needs than did conventional training, as used at the Naval Air Test Center, Patuxent River, Maryland.

To conduct this study, two populations suitable for the purpose of this investigation were first identified. A questionnaire was then developed and administered to the two populations. The responses were then compared using statistical analysis to determine if Transactional Analysis training resulted in a greater awareness of basic human needs than did conventional training.

The populations considered for use in this study were limited to employees at two Naval Air Systems Command field activities.

With the assistance of the Civilian Personnel Office at the Naval Air Test Center, Patuxent River, Maryland, a group

of personnel was identified who had received human needs training using conventional theories. At the Pacific Missile Test Center, Point Mugu, California, the Civilian Personnel Office helped identify a group of personnel who had received training using Transactional Analysis.

II. A DESCRIPTION OF TRANSACTIONAL ANALYSIS AND THE COMPARED TRAINING PROGRAMS

Transactional Analysis is based on the observations of Dr. Eric Berne, during his work as a psychotherapist in San Francisco, that each person demonstrates three very different forms of behavior. At times a person acts and feels like his parent or parent figure. When a person gestures, sounds, and carries himself very nearly as his parent figure did, Berne said that the person was in his Parent ego-state. At other times a person reasons objectively, processes data, solves problems, asks questions, and gives information essentially without feelings, rather like a computer. A person behaving in this manner is in his adult ego-state. At other times a person may think and feel as he did when he was a child, in this case he is in his Child ego-state. Berne used these three ego states to describe his analysis of human behavior. In this paper Parent, Adult, and Child when capitalized will refer to ego states and not to actual parents, adults, or children.

Berne observed that a person in the Parent mode directs himself at another Parent or at a Child. The Child directs himself at another Child or at a Parent. An Adult looks for another Adult. If the Parent is being critical then probably a rebellious or compliant Child will respond. If the Parent is being nurturing then probably a grateful, appreciative Child will respond. This pretty much goes the other way also:

a rebellious Child usually stimulating a critical Parent. The Adult, like a computer, must be turned on to activate. Internally, the Adult is a good mediator between Parent and Child. Externally, the Adult is a good problem solver, but lacks spontaneity (Berne, 1964).

An exchange of recognition between two persons is said to constitute a transaction. All transactions can be classified as either complementary, crossed or ulterior (James and Jongeward, 1971).

A complementary transaction occurs when a message sent from a specific ego state, gets the predicted response from a specific ego state in the other person. The following is an example of a complementary transaction:

Stimulus: Adult to Adult - Where are my cuff links?

Response: Adult to Adult - On the desk.

In this case the lines of communication are open, and the people can continue transacting with one another.

A crossed transaction occurs when an unexpected response is made to the stimulus. The following is an example of a crossed transaction:

Stimulus: Adult to Adult - Where are my cuff links?

Response: Parent to Child - Why don't you keep track of your cuff links?

In this case communications are broken off and the people will tend to withdraw from one another.

An ulterior transaction occurs when a stimulus is directed to one ego state, but is intended to hook another ego state.

The following is an example of an ulterior transaction:

Stimulus: Open - Adult to Adult - This car is our
finest, but it may be too expensive for you.
Hidden - Adult to Child - You probably can't
afford it.

Response: Adult to Adult - Yes, it is too expensive for
me.

Child to Adult - I'll take it.

In this example the hidden message is rejected if the
Adult responds, and it is accepted if the Child is hooked.

Berne also observed that people early in life very often
made decisions about their life position when there was much
confusion and insufficient data. These decisions such as
"I'm O.K. - You're Not O.K.", "I'm Not O.K. - You're O.K.",
which made sense to a very young child, provide the basis for
a life script. The person lives his life according to his
script in order to reinforce the life position he adopted
during childhood. Berne believed that in the proper atmos-
phere unfortunate early decisions could be reddecided in a
more favorable manner (Holloway and Holloway, 1973).

DESCRIPTION OF CONVENTIONAL TRAINING USED AT NAVAL AIR TEST CENTER

At the Naval Air Test Center each person queried had
attended at least one of the following courses:

- Basic Supervisory Development

The objectives of this course was to acquaint new

supervisors with the rudimentary skills of supervision. The instruction was principally by lecture and stressed leadership, communications, cooperation, and personnel functions.

- Supervision and Group Performance

This course was given to explain the human behavior involved in accomplishing a group project. After an introduction to human relations, the course was taught using a participative style where the students conducted group projects in order to experience first hand the interactions involved in a group effort.

- Supervision of the Low Skilled and Culturally Different

This course was intended to provide supervisors an awareness of other cultures besides their own. The course involved participation in which participants had to perform task from a disadvantaged position in order to get a feeling of what it was like to be disadvantaged.

These courses were classified as conventional training because they were based on the traditional theories of work, organizational design, and human needs. Frederick Taylor's study of work and Henri Fayol's organization design model provided part of the bases for the traditional training (Drucker, 1973). Maslow's "hierarchy of basic needs" was used to explain basic human needs in traditional training (Maslow, 1970).

DESCRIPTION OF PROGRAM USED AT PACIFIC MISSILE TEST CENTER

The Pacific Missile Test Center employees had each taken at least one of the following courses:

- Transactional Analysis Communications

The objective of this course was to provide an understanding of and an improvement in personal communications. The dynamics of communications were explained in terms of Transactional Analysis ego states. Exercises were conducted to enable the students to feel their various ego states, and to experience the use of the ego states in problem solving.

- Career Women Seminar

This seminar was intended to enable the participants to realize job satisfaction, and to make more effective contributions to their respective agencies. This seminar addressed questions such as "Who am I at work?", and "Do I want changes in my job or career?".

- Transactional Analysis and Your Career

This course was intended to assist the participants in applying Transactional Analysis to their current jobs and to expand their goals. The course provided the students an introduction to Transactional Analysis as it might be applied to unblocking their potential power to get their careers moving.

- Communication for Women

The objective of this course was to increase the participants' ability to communicate more effectively. The course included group discussions, films, and exercises to provide an opportunity for understanding and practicing effective communication skills.

These courses used Transactional Analysis as their base.

III. THE QUESTIONS AND THEIR RESULTS

An instrument was developed for use in measuring the employees' awareness and understanding of basic human needs. Demographic questions were also included in order to evaluate other factors that might influence the responses of the employees. The questionnaire was carefully worded to avoid the use of Transactional Analysis terminology which might cause a conditioned or triggered response on the part of the employees who had taken the Transactional Analysis training. The questionnaire was pretested by administering it to members of the Naval Aviation Executive Institute Management Program, Point Mugu, California. After pretesting and incorporating corrections, a total of 561 questionnaires were distributed at the Naval Air Test Center and the Pacific Missile Test Center. Appendix A contains a copy of the questionnaire and the cover letter.

Table 1 gives a breakdown of the number of returned questionnaires from the two bases.

DESCRIPTION OF THE QUESTIONNAIRE

Twelve questions contained in the questionnaire were designed to be answered by selection of one of five responses with numeric values as given on the following page.

TABLE 1
NUMBER OF RETURNS BY ORGANIZATION

Pacific Missile Test Center Point Mugu, California			Naval Air Test Center Patuxent River, Maryland			Combined		
Number Distri- buted	Number Returned (Usable)	Percentage Returned	Number Distri- buted	Number Returned (Usable)	Percentage Returned	Number Distri- buted	Number Returned (Usable)	Percentage Returned
263	184	70	298	172	57.7	561	356	63.5

<u>Response</u>	<u>Numeric Value</u>
Strongly Agree	1
Agree	2
No Opinion	3
Disagree	4
Strongly Disagree	5

To prevent the respondents from perceiving a pattern of desired answers, five of the questions were worded negatively (inverted) so that positive responses would be disagree or strongly disagree. To aid in analysis of the data, the responses for the inverted questions were recoded prior to the computer analysis so that disagree and strongly disagree were equated to agree and strongly agree. This recoding allowed all of the attitudinal data to be looked at with a uniform ranking scheme. Under this scheme, strongly agree and agree were taken as an indication of awareness and acceptance of the life position or human need addressed by the question.

RESPONSES TO ATTITUDINAL QUESTIONS

Questions 3, 9, and 11 were designed to measure the respondents' own perception of his personal O.K.-ness. None of these questions were inverted and respondents who felt a personal sense of O.K.-ness would tend to respond with an agree or strongly agree.

Question 3 - *"Generally, I feel confident of my supervisory abilities in the work situation."*

This question is based on the premise that a person holding an I'm O.K. life-position has faith in himself (Harris, 1967).

The frequency of response for each population is given below:

	<u>PMTC</u>	<u>NATC</u>
Strongly Agree	26	42
Agree	124	115
No Opinion	18	10
Disagree	10	4
Strongly Disagree	1	1
Missing	5	-

Question 9 - *"When in a supervisory role, I can adjust my attitudes towards employees as required for increased work performance."*

This question is founded on the belief that a person with an I'm O.K. life position has the flexibility to meet whatever situation comes up (James and Jongeward, 1971).

The responses of the populations to question 9 are given below:

	<u>PTMC</u>	<u>NATC</u>
Strongly Agree	18	25
Agree	119	127
No Opinion	33	12
Disagree	7	4
Strongly Disagree	1	2
Missing	6	2

Question 11 - *"I feel confident of my ability to handle inter-personal relations on the job."*

This question is based on the idea that a person with an I'm O.K. life-position feels capable of handling personal relationships.

The responses to this question are given below:

	<u>PMTC</u>	<u>NATC</u>
Strongly Agree	47	32
Agree	127	125
No Opinion	7	11
Disagree	3	4
Strongly Disagree	-	-

Questions 1, 8, and 10 were designed to measure the respondents' feelings about the O.K.-ness of others.

Question 1 - *"From my personal experience I have found that the concept taught in textbooks which states 'most employees are competent, capable persons' is incorrect."*

This question is inverted and respondents who felt that others are O.K. selected a disagree or strongly disagree answer.

The raw responses to this question are given below:

	<u>PMTC</u>	<u>NATC</u>
Strongly Agree	6	10
Agree	47	64
No Opinion	13	10
Disagree	98	71
Strongly Disagree	20	17

Question 8 - *"In my experience, I have found most employees are not capable of changing their work attitudes and habits to improve their work performance."*

This question reflects the view of persons who believe that others are not O.K. Respondents who felt that others are O.K. selected a strongly disagree or disagree answer to this question (Holloway and Holloway, 1973).

The raw responses to this question are given below:

	<u>PMTc</u>	<u>NATC</u>
Strongly Agree	5	3
Agree	33	27
No Opinion	7	8
Disagree	109	112
Strongly Disagree	30	22

Question 10 - *"Most employees can be trusted to perform and do a conscientious job when left on their own."*

This question is based on the theory that most people want to perform to the best of their abilities (James and Jongeward, 1967). Respondents who believed this theory selected an agree or strongly agree answer.

The responses to this question are given below:

	<u>PMTc</u>	<u>NATC</u>
Strongly Agree	20	17
Agree	138	123
No Opinion	3	3
Disagree	20	26
Strongly Disagree	2	2
Missing	1	1

Question 2 - *"I have found that for most employees the basic satisfaction of doing their work well eliminates the need for any additional recognition."*

This question is based on the theory that people have a basic need for recognition (Berne, 1964). Respondents who were aware of this need selected a disagree or strongly disagree response to this question.

The raw responses to this question are given below:

	<u>PMTC</u>	<u>NATC</u>
Strongly Agree	6	3
Agree	17	20
No Opinion	3	2
Disagree	85	82
Strongly Disagree	73	64
Missing	-	1

Question 4 - *"Employees have a definite need for emotional and physical stimulation to continue to be productive in the work situation."*

Question 4 is based on the fact that people have a biological, psychological, and social need for stimulation (Berne, 1964). An agree or strongly agree response was selected by respondents who were aware of this need.

The responses to this question are given below:

	<u>PMTC</u>	<u>NATC</u>
Strongly Agree	81	65
Agree	88	89
No Opinion	7	6
Disagree	4	8

	<u>PMTc</u>	<u>NATC</u>
Strongly Disagree	3	4
Missing	1	-

Question 5 - *"I disagree with the concept that employees will seek attention on the job, even if it be negative, rather than accept no recognition at all."*

This question is intended to measure the respondents' awareness of the fact that the need for recognition is so strong that people will even seek adverse recognition in the absence of positive recognition (Berne, 1964). Respondents who were aware of this fact selected a disagree or strongly disagree response to this question.

The raw responses to this question are given below:

	<u>PMTc</u>	<u>NATC</u>
Strongly Agree	12	11
Agree	63	69
No Opinion	18	14
Disagree	58	63
Strongly Disagree	30	15
Missing	3	-

Question 6 - *"Most employees have had their basic work attitudes and personalities established prior to entering the work force."*

Question 6 was included to test the respondents' awareness of childhood scripting. This theory is based on the hypothesis that most people live their lives according to

decisions that they made in early childhood (Holloway and Holloway, 1973).

The responses to this question are given below:

	<u>PMTc</u>	<u>NATC</u>
Strongly Agree	29	27
Agree	105	86
No Opinion	7	6
Disagree	38	46
Strongly Disagree	5	7

Question 7 - *"Most employees have a definite need for a structured daily work schedule."*

This question is based on the observation that people have a definite need to avoid boredom which results in a time structure-hunger (James and Jongeward, 1971). Awareness of time structure-hunger was reflected by selection of an agree or strongly agree response.

The responses to this question are given below:

	<u>PMTc</u>	<u>NATC</u>
Strongly Agree	9	29
Agree	109	95
No Opinion	10	8
Disagree	45	37
Strongly Disagree	11	2
Missing	-	1

Question 12 - *"In my experience I have not found the need for open and complete communications on the job to be as important as stated in textbooks."*

This question is used to measure the respondents' belief in the need for good communications on the job. The question is based on the assumption that business transactions cannot be completed in the absence of open communications (Berne, 1964). Respondents who believed in the need for good communications on the job selected a disagree or strongly disagree response to this question.

The raw responses to this question are given below:

	<u>PBTC</u>	<u>NATC</u>
Strongly Agree	6	9
Agree	14	15
No Opinion	5	8
Disagree	76	71
Strongly Disagree	83	68
Missing	-	1

Table 2 contains a summary of the responses from the two populations to the attitudinal questions. Many respondents indicated that question five was ambiguous. For this reason, the author decided not to use the responses to this question in calculating the average responses of the two populations.

RESPONSES TO DEMOGRAPHIC QUESTIONS

Questions 13 through 16 were included to gather demographic information from the respondents.

Question 13 - *"Please indicate the level of your formal education."*

1. High School
2. Associate of Arts degree or equivalent

BREAKDOWN OF RESPONSES FROM PMTC AND NATC

Question No. and Name	Population					
	PMTC			NATC		
	Percentage of Responses			Percentage of Responses		
	Agree	No Opinion	Disagree	Agree	No Opinion	Disagree
1. *You're O.K.-1	64.2	7.1	28.8	51.2	5.8	43.0
2. *Recognition Hunger	85.9	1.6	12.5	85.4	1.2	13.5
3. I'm O.K.-1	83.8	10.1	6.2	91.3	5.8	2.9
4. Stimulation Hunger	92.4	3.8	3.8	89.5	3.5	7.0
5. *Recognition Need Even Negative	48.6	9.9	41.4	45.3	8.1	46.5
6. Childhood Scripting	72.9	3.8	23.4	65.7	3.5	30.8
7. Time Structure Hunger	64.1	5.4	30.5	72.6	4.7	22.8
8. *You're O.K.-2	75.5	3.8	20.6	77.9	4.7	17.4
9. I'm O.K.-2	77.0	18.5	4.5	89.4	7.1	3.6
10. You're O.K.-3	86.3	1.6	12.0	81.9	1.8	16.4
11. I'm O.K.-3	94.6	3.8	1.6	91.3	6.4	2.3
12.*Need for Uncrossed Transactions	86.4	2.7	10.9	81.3	4.7	14.1
**Averages	80.3	6.4	14.1	79.8	4.4	15.8

*Recorded responses are used in this table.

**Responses to question 5 were not included in the averages.

3. More than two years college
4. Undergraduate degree
5. Graduate degree - Please state whether
graduate degree is at the Masters or Ph.D.
level _____

The responses to this question are given below:

<u>Group</u>	<u>PMT</u> C	<u>NAT</u> C
1	82	96
2	22	20
3	21	9
4	28	26
5	26	21
Missing	5	-

Question 14 - "How long have you been in government?"

1. One year or less
2. Two or three years
3. Four or five years
4. Six to ten years
5. More than ten years

The responses to this question are given below:

<u>Group</u>	<u>PMT</u> C	<u>NAT</u> C
1	-	-
2	22	18
3	12	20
4	48	53
5	97	81
Missing	5	-

Question 15 - "What is your Rank or Grade level?"

The responses to this question were ranked in interval order. The responses to this question are given below:

<u>Group</u>	<u>PMTC</u>	<u>NATC</u>
GS 2&3	5	-
GS 4&5	72	46
GS 6&7	26	28
GS 8&9	10	17
GS 10&11	23	30
GS 12&13	34	40
GS 14&15	6	6
Missing	8	5

Question 16 - "What is your age?"

1. Twenty-four or under
2. Twenty-five to twenty-nine
3. Thirty to thirty-nine
4. Forty to forty-nine
5. Over forty-nine

The responses to this question are given below:

<u>Group</u>	<u>PMTC</u>	<u>NATC</u>
1	9	11
2	31	41
3	47	59
4	44	32
5	48	29
Missing	5	-

ANALYSIS OF DATA

The statistical Chi-square test was used to compare the responses of the two populations. Application of this test determined if the responses from the two populations differed at the 0.05 level of statistical significance (95% confidence level). For each question where the populations differed at the 0.05 level of statistical significance, the results were then checked to see if the responses showed a meaningful difference.

Table 3 contains the results of the Chi-square test for the two populations' response to each question. At the 0.05 level of statistical significance the two populations differed on only two of the attitudinal questions, 3 and 7, and two of the demographic questions, 15 and 16.

The findings of the data from the attitudinal questions show that the two populations were statistically alike 83% of the time. It is interesting to note the similarity of the average responses of the two populations as shown in Table 2. PMTC had an average percentage of 80.3 agree responses, and NATC had an average percentage of 79.9 agree responses. On the disagree responses PMTC had an average percentage of 14.1, and NATC had an average percentage of 15.8. These results show that both populations had a good awareness and acceptance of the concepts of basic human needs.

Table 3 indicates that the two populations differed at the 0.05 level of statistical significance on grade level and age. Because the two populations showed essentially the same over

TABLE 3

COMPARISON OF POPULATIONS FROM PMTC and NATC

Question No. & Name	1	2	3	4	5***	COMPARISON	
						Population are alike when χ^2 column 3 less than χ^2 column 5, differ when χ^2 for column 3 greater than column 5	7
1. Your're OK-1			8.56	4	9.49	ALIKE	****
2. Recognition			1.65	4	9.49	****	
3. I'm OK-1			8.79	4	9.49	****	
4. Stimulation			2.83	4	9.49	****	
5. Neg. Recognition			5.95	4	9.49	****	
6. Childhood Script			3.01	4	9.49	****	
7. Time Structure			18.21	4	9.49		****
8. You're OK-2			2.73	4	9.49	****	
9. I'm OK-2			12.29	4	9.49		****
10. You're OK-3			1.44	4	9.49	****	
11. I'm OK-3			3.55	3	7.82	****	
12. Uncrossed Trans.			2.40	4	9.49	****	

13.	Education Level	6.45	4	9.49	***
14.	Yrs Govt. Service	3.82	3	7.82	***
15.	GS Level	14.03	6	12.59	***
16.	Age	9.70	4	9.49	***

* The derivation of the χ^2 value is shown in Appendix B.

** Degree of freedom is the number of possible responses utilized minus one times the number of populations minus one. (No. of responses - 1) x (No. of populations - 1)

*** These values come from the Chi-square tables.

all response to the attitudinal questions, the differences between the two populations in these two demographic areas were not meaningful to this study.

APPENDIX A
QUESTIONNAIRE

This appendix contains an exact copy of the letter of introduction and questionnaire that was sent to 561 individuals at the Pacific Missile Test Center, Point Mugu, California and the Naval Air Test Center, Patuxent River, Maryland

NAVAL POSTGRADUATE SCHOOL

MONTEREY, CALIFORNIA - 93940

IN REPLY REFER TO:

Code 55

0001-2

To Questionnaire Recipient:

This questionnaire has been sent to you in order to gather research data for a study on attitudes of employees located at a NAVAIR SYSCOM Field Activity. This study is part of a project being conducted through the Naval Postgraduate School, Monterey, California. The data is being analyzed by a member of the Naval Aviation Executive Institute Program located at Point Mugu, California.

Your answers will provide valuable and unique data for establishing a baseline on employee attitudes. Your personal identity and individual response will not be divulged. The questionnaires do not have to be signed. The success or failure of this research project will depend upon your response.

Please enter the most appropriate answer in the box at the right

From my personal experience I have found that the concept taught in text books which states "most employees are competent capable persons" is incorrect.

Strongly agree
Agree
No Opinion
Disagree
Strongly disagree
1 2 3 4 5

I have found that for most employees the basic satisfaction of doing their work well eliminates the need for any additional recognition.

1 2 3 4 5

Generally, I feel confident of my supervisory abilities in the work situation.

1 2 3 4 5

Employees have a definite need for emotional and physical stimulation to continue to be productive in the work situation.

1 2 3 4 5

I disagree with the concept that employees will seek attention on the job, even if it be negative, rather than accept no recognition at all.

1 2 3 4 5

Most employees have had their basic work attitudes and personalities established prior to entering the work force.

1 2 3 4 5

Most employees have a definite need for a structured daily work schedule.

1 2 3 4 5

In my experience, I have found most employees are not capable of changing their work attitudes and habits to improve their work performance.

1 2 3 4 5

When in a supervisory role I can adjust my attitudes toward employees as required for increased work performance.

1 2 3 4 5

Most employees can be trusted to perform and do a conscientious job when left on their own.

1 2 3 4 5

I feel confident of my ability to handle interpersonal relations on the job.

1 2 3 4 5

In my experience I have not found the need for open and complete communications on the job to be as important as stated in text books.

1 2 3 4 5

Please enter the most appropriate answer in the box at the right

Please indicate the level of your formal education.

1. High school /_/_/
2. Associate of Arts degree or equivalent /_/_/
3. More than two years college /_/_/
4. Undergraduate degree /_/_/
5. Graduate degree /_/_/ Please state whether graduate degree is at the masters or Ph.D. level _____

How long have you been in government service?

1. One year or less /_/_/
2. Two or three years /_/_/
3. Four or Five years /_/_/
4. Six to ten years /_/_/
5. More than ten years /_/_/

What is your Rank or Grade level?

What is your age?

1. Twenty-four or under /_/_/
2. Twenty-five to twenty-nine /_/_/
3. Thirty to thirty-nine /_/_/
4. Forty to forty-nine /_/_/
5. Over Forty-nine /_/_/

APPENDIX B

CHI-SQUARE CALCULATIONS

The Chi-square values shown in table 3 were calculated as follows:

$$\chi^2 = \sum_{i=1}^r \sum_{j=1}^k \frac{(O_{i,j} - E_{i,j})^2}{E_{i,j}}$$

where

$O_{i,j}$ = observed number of responses assigned to the i^{th} row of the j^{th} column.

$E_{i,j}$ = number of responses expected to be assigned to the i^{th} row of the j^{th} column.

The expected values for each cell ($E_{i,j}$) were found by multiplying the column total times the row total, for each cell in the contingency table and dividing this product by the total number of responses.

The values of χ^2 resulting from the formula are distributed approximately as chi-square with $df = (r-1)(k-1)$, where r = the number of rows and k = the number of columns in the contingency table.

VAR006 CHILDHOOD SCRIPTING

CODE

```

1.00 ***** ( 29)
      I STRONGLY AGREE
      I
2.00 ***** ( 105)
      I AGREE
      I
3.00 ***** ( 7)
      I NO OPINION
      I
4.00 ***** ( 38)
      I DISAGREE
      I
5.00 ***** ( 5)
      I STRONGLY DISAGREE
      I
      I.....I.....I.....I.....I.....I.....I
      0 40 80 120 160 200
      FREQUENCY
  
```

MEAN	2.375	STD ERR	.078	MEDIAN	2.100
MODE	2.000	STD DEV	1.064	VARIANCE	1.132
KURTOSIS	-.387	SKEWNESS	.793	RANGE	4.000
MINIMUM	1.000	MAXIMUM	5.000	SUM	437.000
C.V. PCT	44.795	.95 C.I.	2.220	TU	2.530

VALID CASES 184 MISSING CASES 0

VAR007 TIME STRUCTURE HUNGER

CODE

```
1.00 *** ( 9)
I STRONGLY AGREE
2.00 ***** ( 109)
I AGREE
3.00 *** ( 10)
I NO OPINION
4.00 ***** ( 45)
I DISAGREE
5.00 *** ( 11)
I STRONGLY DISAGREE
I
I .....I.....I.....I.....I.....I
0 40 80 120 160 200
FREQUENCY
```

MEAN	2.674	STD ERR	.080	MEDIAN	2.261
MODE	2.000	STD DFV	1.082	VARIANCE	1.172
KURTOSIS	-.781	SKEWNESS	.726	RANGE	4.000
MINIMUM	1.000	MAXIMUM	5.000	SUM	492.000
C.V. PCT	40.483	.95 C.I.	2.516	TO	2.831

VALID CASES 144 MISSING CASES 0

VAR008 YOU ARE OK2

CODE

```

1.00 ***** ( 30)
I STRONGLY AGREE
I
2.00 ***** ( 109)
I AGREE
I
3.00 *** ( 7)
I NO OPINION
I
4.00 ***** ( 33)
I DISAGREE
I
5.00 ** ( 5)
I STRONGLY DISAGREE
I

```

```

I.....I.....I.....I.....I.....I
0 40 80 120 160 200
FREQUENCY

```

MEAN	2.315	STD ERR	.076	MEDIAN	2.069
MODE	2.000	STD DEV	1.034	VARIANCE	1.069
KURTOSIS	-.031	SKEWNESS	.917	RANGE	4.000
MINIMUM	1.000	MAXIMUM	5.000	SUM	426.000
C.V. PCT	44.668	.95 C.I.	2.165	T0	2.466

VALID CASES	184	MISSING CASES	0
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VAR009	I AM OK?
CODF	
1.00	STRONGLY AGREE
2.00	AGREE
3.00	NO OPINION
4.00	DISAGREE
5.00	STRONGLY DISAGREE
(MISSING)	
FREQUENCY	

MEAN	2.180	STD FRR	.051	MEDIAN	2.097
MODE	2.000	STD DEV	.682	VARIANCE	.465
KURTOSIS	2.000	SKEWNESS	.941	RANGE	4.000
MINIMUM	1.000	MAXIMUM	5.000	SUM	388.000
C.V. PCT	31.272	.95 C.I.	2.079	TD	2.281
VALID CASES	178	MISSING CASES	6		


```

VAR010  YOU ARE OK3
CODE
1.00  ***** ( 20)
      I STRONGLY AGREE
      I
2.00  ***** ( 138)
      I AGREE
      I
3.00  ** ( 3)
      I NO OPINION
      I
4.00  ***** ( 20)
      I DISAGREE
      I
5.00  ** ( 2)
      I STRONGLY DISAGREE
      I
0 * ( 1)
(MISSING) I
      I
      I.....I.....I.....I.....I.....I.....I
      0 40 80 120 160 200
      FREQUENCY
  
```

MEAN	2.158	STD ERR	.059	MEDIAN	2.018
MODE	2.000	STD DEV	.800	VARIANCE	.640
KURTOSIS	2.375	SKEWNESS	1.518	RANGE	4.000
MINIMUM	1.000	MAXIMUM	5.000	SUM	395.000
C.V. PCT	37.051	.95 C.I.	2.042	TO	2.275
VALID CASES	1P3	MISSING CASES	1		

VAR012 NEED FOR UNCROSSED TRANSACTIONS

3000

100 ***** 839

I STRONGLY AGREE

2.00 ***** (76)

I AGREE

3.00 ***** (5)

I NO OPINION

4.00 ☆☆☆☆☆☆ (14)

I DISAGREE

5.00 ★★★★★ (6)

I STRONGLY DISAGREE

Year	1900	1910	1920	1930	1940	1950	1960	1970	1980	1990	2000
Population	1	1	1	1	1	1	1	1	1	1	1
Area	1	1	1	1	1	1	1	1	1	1	1
Volume	1	1	1	1	1	1	1	1	1	1	1
Weight	1	1	1	1	1	1	1	1	1	1	1
Length	1	1	1	1	1	1	1	1	1	1	1
Width	1	1	1	1	1	1	1	1	1	1	1
Height	1	1	1	1	1	1	1	1	1	1	1
Depth	1	1	1	1	1	1	1	1	1	1	1
Temperature	1	1	1	1	1	1	1	1	1	1	1
Pressure	1	1	1	1	1	1	1	1	1	1	1
Humidity	1	1	1	1	1	1	1	1	1	1	1
Wind Speed	1	1	1	1	1	1	1	1	1	1	1
Cloud Cover	1	1	1	1	1	1	1	1	1	1	1
Precipitation	1	1	1	1	1	1	1	1	1	1	1
Solar Radiation	1	1	1	1	1	1	1	1	1	1	1
Air Quality	1	1	1	1	1	1	1	1	1	1	1
Water Quality	1	1	1	1	1	1	1	1	1	1	1
Soil Quality	1	1	1	1	1	1	1	1	1	1	1
Vegetation	1	1	1	1	1	1	1	1	1	1	1
Wildlife	1	1	1	1	1	1	1	1	1	1	1
Human Activity	1	1	1	1	1	1	1	1	1	1	1
Infrastructure	1	1	1	1	1	1	1	1	1	1	1
Transportation	1	1	1	1	1	1	1	1	1	1	1
Communication	1	1	1	1	1	1	1	1	1	1	1
Education	1	1	1	1	1	1	1	1	1	1	1
Healthcare	1	1	1	1	1	1	1	1	1	1	1
Industry	1	1	1	1	1	1	1	1	1	1	1
Commerce	1	1	1	1	1	1	1	1	1	1	1
Government	1	1	1	1	1	1	1	1	1	1	1
Law	1	1	1	1	1	1	1	1	1	1	1
Religion	1	1	1	1	1	1	1	1	1	1	1
Culture	1	1	1	1	1	1	1	1	1	1	1
Art	1	1	1	1	1	1	1	1	1	1	1
Science	1	1	1	1	1	1	1	1	1	1	1
Technology	1	1	1	1	1	1	1	1	1	1	1
Energy	1	1	1	1	1	1	1	1	1	1	1
Environment	1	1	1	1	1	1	1	1	1	1	1
Climate	1	1	1	1	1	1	1	1	1	1	1
Weather	1	1	1	1	1	1	1	1	1	1	1
Disaster	1	1	1	1	1	1	1	1	1	1	1
Security	1	1	1	1	1	1	1	1	1	1	1
Defense	1	1	1	1	1	1	1	1	1	1	1
Peace	1	1	1	1	1	1	1	1	1	1	1
Justice	1	1									

CONFIDENTIAL

MEAN	1.826	STD ERR	.076	MEDIAN	1.618
MODE	1.000	STD DEV	1.025	VARIANCE	1.052
KURTOSIS	1.819	SKEWNESS	1.511	RANGE	4.000
MINIMUM	1.000	MAXIMUM	5.000	SUM	336.000
C.V. PCT	56.156	.95 C.I.	1.677	T0	1.975

MODE	1.000	STD DEV
------	-------	---------

KURTOSIS 1.819
SKEWNESS

	MINIMUM	MAXIMUM
1.000		

C.V.	PCT	54.156	.95 C.I.

VALID CASES	MISSING CASES	
184	0	

VAR014 YEARS OF GOVERNMENT SERVICE

CONF

```

I
2.00 ***** ( 22)
I -1-00-3-
I
3.00 ***** ( 12)
I -4-00-5-
I
4.00 ***** ( 48)
I -6-10-10
I
5.00 ***** ( 97)
I GREATER-10
I
0 *** ( 5)
(MISSING) I
I
I .....I.....I.....I.....I.....I
0 20 40 60 80 100
FREQUENCY

```

50

```

MEAN      4.229
MODE      5.000
KURTOSIS  .076
MINIMUM   2.000
C.V. PCT  24.276

STD FPR    .077
STD OFV    1.027
SKEWNESS  -1.156
MAXIMUM    5.000
.95 C.I.   4.078

MEDIAN     4.577
VARIANCE   1.054
RANGE      3.000
SUM        757.000
TO         4.380

```

VALID CASES 179 MISSING CASES 5

VAR001 YOU ARE OK1

3067

1. I ***** (17)
I ***** STRONGLY AGREE
I *****
2. I ***** (71)
I *****

3. ***** (10)
I NO OPINION

4. ***** I DISAGREE ***** (64)

5. ***** (10)
I STRONGLY DISAGREE

[illegible]

MEAN	2.878	STD ERR	.090	MEDIAN	2.472
MODE	2.000	STD DEV	1.186	VARIANCE	1.406
KURTOSIS	-1.340	SKEWNESS	.089	RANGE	4.000
MINIMUM	1.000	MAXIMUM	5.000	SUM	495.000
C.V. PCT	41.203	.95 C.I.	2.699	TD	3.056

VALID CASES	172	MISSING CASES	0
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```

VAR003      I AM OK1
      CODE
1.00 ***** ( 42)
      I
      T STRONGLY AGREE
      T
2.00 ***** ( 115)
      I AGREE
      I
3.00 ***** ( 10)
      I NO OPINION
      I
4.00 ***** ( 4)
      I DISAGREE
      I
5.00 * ( 1)
      I STRONGLY DISAGREE
      I
      I.....I.....I.....I.....I.....I.....I
      0      40      80      120      160      200
      FREQUENCY
  
```

MEAN	1.878	STD ERR	.050	MEDIAN	1.883
MODE	2.000	STD DEV	.660	VARIANCE	.435
KURTOSIS	3.735	SKEWNESS	1.115	RANGE	4.000
MINIMUM	1.000	MAXIMUM	5.000	SUM	323.000
C.V. PCT	35.133	.95 C.I.	1.779	TD	1.977

VALID CASES 172 MISSING CASES 0

VAR005 RECOGNITION NEED EVEN NEGATIVE

အပူကပ်

1

(15) *****

00.1

I STRONGLY AGREE

1

2.00 ***** (63)

I AGREE

3.00 ☆☆☆☆☆☆ (171)

PRINTED BY

I

4.00 (69)

Y DTSAGREF

I

5.00 ★★★★★ (11)

I STRONGLY DISAGREE

I

[illegible]

0 20

FREQUENCY

MEAN	2.988	STD ERR	.090	MEDIAN	3.071
MODE	4.000	STD DEV	1.175	VARIANCE	1.380
KURTOSIS	-1.310	SKEWNESS	-.064	RANGE	4.000
MINIMUM	1.000	MAXIMUM	5.000	SUM	514.000
C.V. PCT	39.310	.95 C.I.	2.812	TOTAL	3.165

	VALID CASES	MISSING CASES	0
1	172		

VAR006 CHILDHOOD SCRIPTING

306

1.00 ***** (27)

I STRONGLY AGREE

I

2.00.2

I AGREE



3.000 ★★★★★ (6)

NOTATION

—

4.00 ***** (46)

I DISAGREE

—

5.00 ★★★★★ (7)

Y STRONGLY DISAGREE

1

I.....I.....I.....I.....I.....I.....	20	40	60	80	100	
I.....I.....I.....I.....I.....I.....	0	20	40	60	80	100

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FREQUENCY

MEAN	2.535	STD ERR	.089	MEDIAN	2.186
MODE	2.000	STD DEV	1.162	VARIANCE	1.350
KURTOSIS	-.973	SKEWNESS	.521	RANGE	4.000
MINIMUM	1.000	MAXIMUM	5.000	SUM	436.000
C.V. PCT	45.830	.95 C.I.	2.360	TOTAL	2.710

MODE	2.000	STD DEV
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KURTOSIS - .973
SKEWNESS

	MINIMUM	MAXIMUM
1.000		

C.V. PCT 45.830 .95 C.I.

	VALID CASES	172	MISSING CASES	0
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99				
100				

VAR008 YOU ARE OK2

CODE

1.00 ***** (22)
I I STRONGLY AGREE

2.00 ***** (112)
I I AGREE

3.00 *** (8)
I I NO OPINION

4.00 ***** (27)
I I DISAGREE

5.00 ** (3)
I I STRONGLY DISAGREE

I.....I.....I.....I.....I.....I.....I
0 40 80 120 160 200
FREQUENCY

MEAN	2.285	STD ERR	.072	MEDIAN	2.071
MODE	2.000	STD DEV	.940	VARIANCE	.883
KURTOSIS	.464	SKEWNESS	1.059	RANGE	4.000
MINIMUM	1.000	MAXIMUM	5.000	SUM	393.000
C.V. PCT	41.132	.95 C.I.	2.143	T0	2.426

VALID CASES	172	MISSING CASES	0
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```

VAR009  I AM OK2
CODE
1.00 ***** ( 25)
I STRONGLY AGREE
I
2.00 ***** ( 127)
I AGREE
I
3.00 ***** ( 12)
I NO OPINION
I
4.00 ** ( 4)
I DISAGREE
I
5.00 ** ( 2)
I STRONGLY DISAGREE
I
0 ** ( 2)
(MISSING) I
I
I.....I.....I.....I.....I.....I.....I
0 40 80 120 160 200
FREQUENCY

```

MEAN	2.006	STD ERR	.050	MEDIAN	1.972
MODE	2.000	STD DEV	.648	VARIANCE	.420
KURTOSIS	5.813	SKEWNESS	1.564	RANGE	4.000
MINIMUM	1.000	MAXIMUM	5.000	SUM	341.000
C.V. PCT	32.312	.95 C.I.	1.908	TO	2.104
VALID CASES	170	MISSING CASES	2		

VAR013 EDUCATION LEVEL

3007

[illegible]

MEAN	2.163	STD ERR	.116	MEDIAN	1.396
MODE	1.000	STD DEV	1.517	VARIANCE	2.301
KURTOSIS	-.959	SKEWNESS	.832	RANGE	4.000
MINIMUM	1.000	MAXIMUM	5.000	SUM	372.000
C.V. PCT	70.134	.95 C.I.	1.934	TD	2.391

	VALID CASES	MISSING CASES	0
1	172		


```
VAR015  GS LEVEL BY GROUP
CODE
2.00 ***** ( 46)
I GS=4-AND 5
I
3.00 ***** ( 28)
I GS=6-AND-7
I
4.00 ***** ( 17)
I GS=8-AND-9
I
5.00 ***** ( 30)
I GS=10-AND-11
I
6.00 ***** ( 40)
I GS=12-AND-13
I
7.00 ***** ( 6)
I GS=14-AND-15
I
(MISSING) ***** ( 5)
I
I
I .....I.....I.....I.....I.....I.....I
0 10 20 30 40 50
FREQUENCY
```

MEAN	4.048	STD ERR	.128	MEDIAN	4.059
MODE	2.000	STD DEV	1.657	VARIANCE	2.745
KURTOSIS	-1.468	SKEWNESS	.067	RANGE	5.000
MINIMUM	2.000	MAXIMUM	7.000	SUM	676.000
C.V. PCT	40.928	.95 C.I.	3.795	TO	4.301
VALID CASES	167	MISSING CASES	5		

APPENDIX D

Historical Data Bank

Statistical data bank is contained in this appendix for both populations. Populations are identified by the last integer of each line. The integer 1, corresponds with Pacific Missile Test Center, and the integer 2, corresponds with Naval Air Test Center.

45115245421512231	422222242222515251	453222423222514241	422222242222515251
44222344222420221	452222254212524551	24215425222454531	452222254212524551
15211545211314221	2422424222415541	25222324111512221	2422424222415541
22324144311414251	44224244222524521	44225145121512231	44224244222524521
44212421241542221	55225345222535231	45115124121544331	55225345222535231
41315124321424221	34222224222535441	4422424222213221	34222224222535441
24113244222555631	25215244244455641	34324444222414331	25215244244455641
25211244222524231	45324114223415221	45114155122535631	45324114223415221
1501444021512231	22233224222414231	44352221122414131	22233224222414231
55152255112524241	54114245212545551	55115324122535541	54114245212545551
55412144421554631	45114225211515351	44121224212555531	45114225211515351
45223444213514221	54134355312555741	45212152222415241	54134355312555741
44214425222414321	45214224222425541	45222152222525351	45214224222425541
41215424121515331	4422442222225341	22222242222214221	4422442222225341
44214222321514221	24214445221533221	4522222442245651	24214445221533221
24224224222455641	44214224221545651	24213114242515251	44214224221545651
25021444021542211	45212222222515341	45205222242515251	45212222222515341
34223224222414151	44224454222413221	22212242221455641	44224454222413221
2432322422355741	44222222342135551	44225444322554631	44222222342135551
24222424222415351	45212224222525421	44224224222425641	45212224222525421
25212222221414221	45122124121445051	434242242355641	45122124121445051
22212424141455631	55222244421455741	53214235211442321	55222244421455741
24222244321555641	350131420222534451	35242444323214231	350131420222534451
25112425111435331	41412422222215341	42212124222515341	41412422222215341
54112224121555551	45233243222414221	34221234221544631	45233243222414221
45215222222525251	22222222224215241	21244225232414321	22222222224215241
54122244211445751	54224224212415251	44434424242535631	54224224212415251
55215124222512231	54124244221455631	44110424221545251	54124244221455631
44212224321413251	24225224222445651	5422422422240001	24225224222445651
45214324222555751	24422224342512211	45224122222115341	24422224342512211
44222424222414141	24222224022235351	42232323222225551	24222224022235351
44224424222415551	45224224242542351	1441122513310001	452244224242542351
25312124221412211	44224224322513231	4421442222512211	44224224322513231
242245253222514221	45115422222415451	45015424311514031	45115422222415451
54113424111545451	55225423322425241	35225424222555351	55225423322425241
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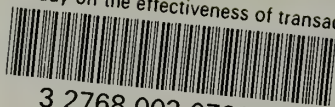
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